Flying Wires

This document is meant to be a comprehensive gathering and storage site of information pertaining to flying wire geometry

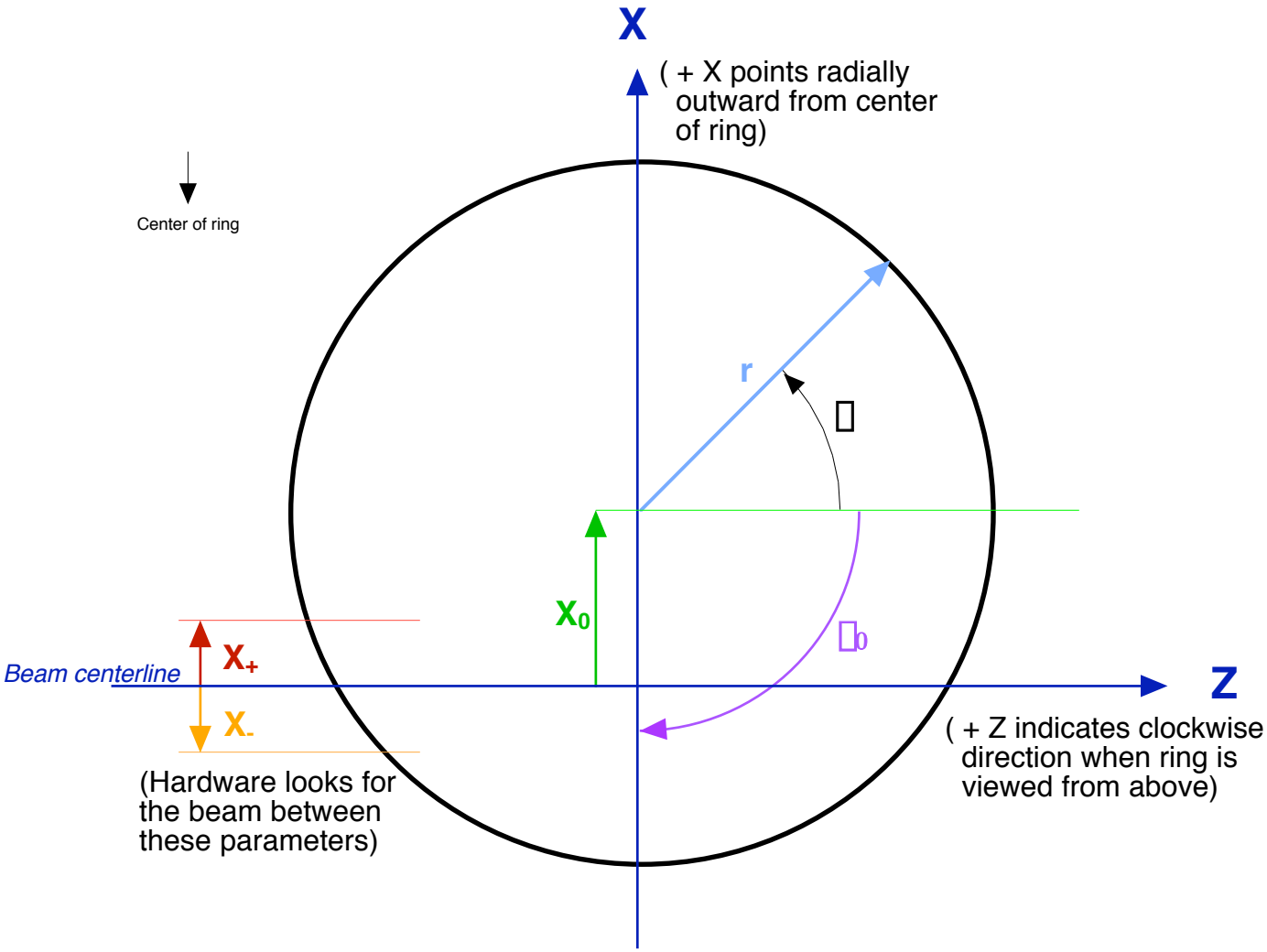
To begin with, the geometry of the wires is defined. Then follows, in tabular form, the parameters associated with the individual wires. (Note that the aperture numbers in this document (X_+,X_-,Y_+,Y_-) are circumstantial values that are set the fly specifications and are included here simply as examples.) Lastly, diagrams have been included to give a visu explanation of each flying wire setup.

If you would like to view photos of the flying wire setup for particular wire, please refer to one of the following files:

MI photos (MI10H,V)
RR photos (MI62H,V)
TEV photos (E17H,E11H,V)
PBAR photos (COREH,760H,TAILH)
PBAR photos (COREV,760L)
PBAR photos (COREV,TAILV)

Flying Wire Coordinates (H)

Horizontal wire *-- measures transverse beam density profile as it rotates in a horizontal circle*



DEFINITIONS

θ = angle
θ_0 = encoder reference angle
K_E = encoder constant,
$K_E = \pm 2\pi/N$ (where N is # of counts per rotation)
θ_E = encoder counts
X_0 = wire offset
r = rotation radius

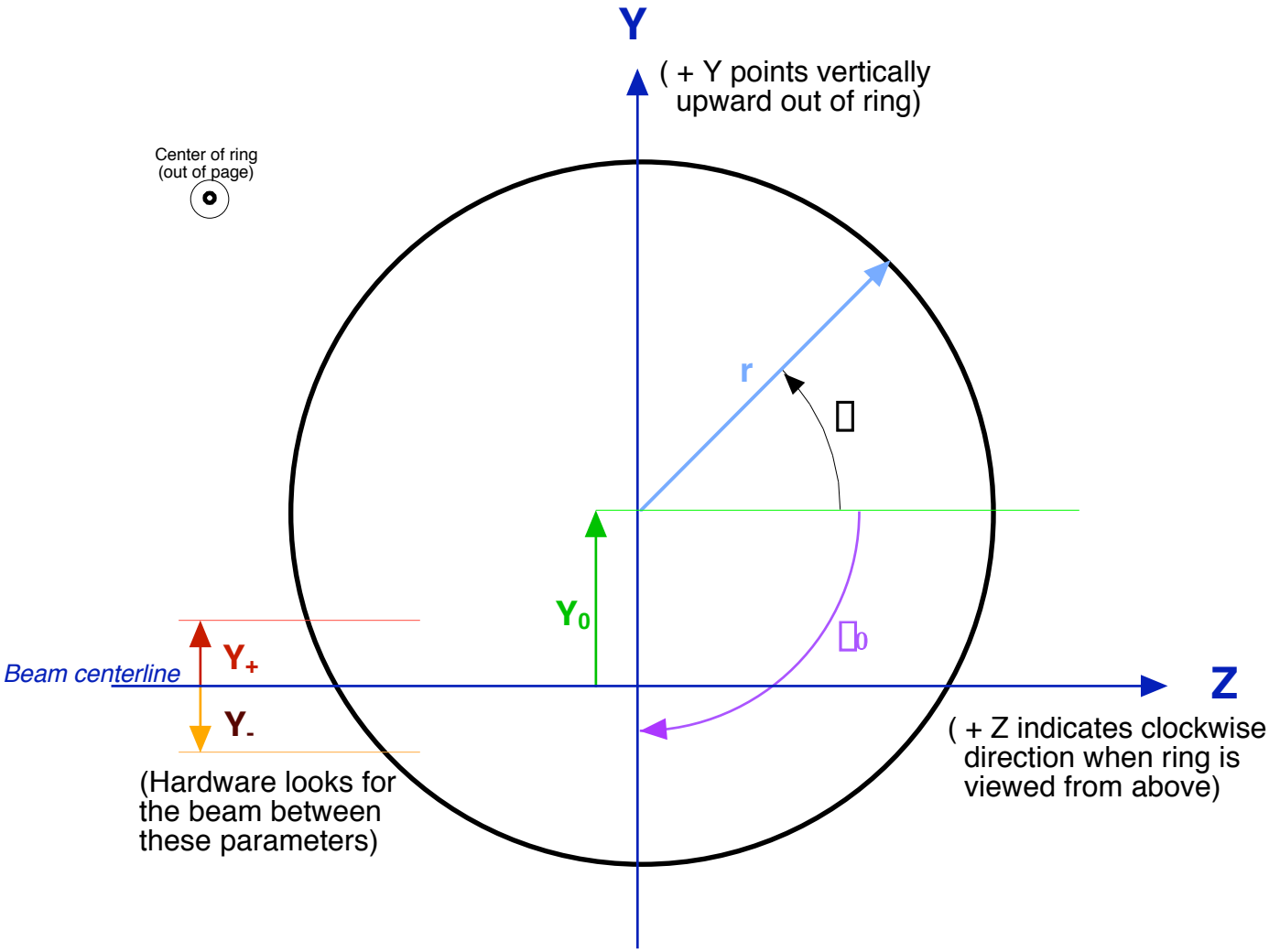
EQUATIONS

$$\theta = \theta_0 + K_E \theta_E$$

$$X = X_0 + r \sin\theta$$

Flying Wire Coordinates (V)

Vertical wire *-- measures longitudinal beam density profile as it rotates in a vertical circle*



DEFINITIONS

θ = angle
θ_0 = encoder reference angle
K_E = encoder constant,
$K_E = \pm 2\pi/N$ (where N is # of counts per rotation)
θ_E = encoder counts
Y_0 = wire offset
r = rotation radius

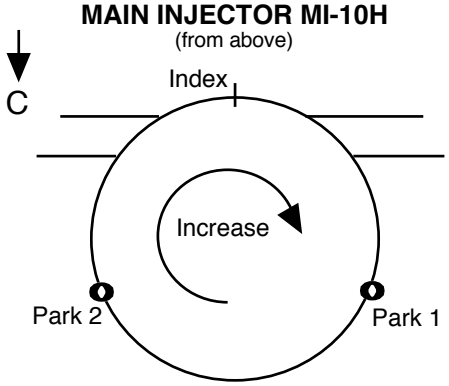
EQUATIONS

$$\theta = \theta_0 + K_E \theta_E$$

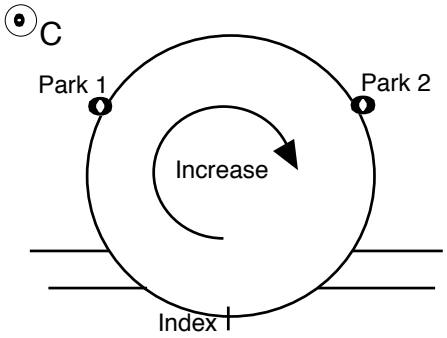
$$Y = Y_0 + r \sin\theta$$

A	B	C	D	E	F	G	H	I
ACCELERATOR	LOCATION	PLANE	Xo or Yo	Ke	□□	r	X+ or Y+	X- or Y-
			(mm)			(mm)	(mm)	(mm)
MI	MI-10	*Horizontal*	- 30	- 0.000383	+ 1.570	133	+ 35	- 33
MI	MI-10	*Vertical*	+ 30	- 0.000383	- 1.570	133	+ 35	- 33
RR	MI-62	*Horizontal*	- 30	+ 0.00038	- 1.570	133	+ 35	- 33
RR	MI-62	*Vertical*	- 30	- 0.000383	- 1.570	133	+ 35	- 33
TEV	E-11	*Horizontal*	+ 30	- 0.000383	- 1.570	96.5	+ 35	- 33
TEV	E-11	*Vertical*	- 30	- 0.000383	- 1.570	96.5	+ 35	- 33
TEV	E-17	*Horizontal*	+ 30	- 0.000383	- 1.570	96.5	+ 35	- 33
P-BAR	E-760 HD	*Horizontal*	+ 125	- 0.000383	+ 1.570	133	+ 25	- 25
	**High Dispersion*							
P-BAR	E-760 LD	*Horizontal*	- 70	- 0.000383	- 1.570	133	+ 25	- 25
	**Low Dispersion*							
P-BAR	CORE	*Horizontal*	- 60	- 0.000383	- 1.570	133	+ 25	- 25
P-BAR	CORE	*Vertical*	+ 75	+ 0.00038	- 1.570	133	+ 25	- 25
P-BAR	TAIL	*Horizontal*	+ 50	- 0.000383	+ 1.570	133	+ 25	- 25
P-BAR	TAIL	*Vertical*	+ 75	- 0.000383	+ 1.570	133	+ 25	- 25

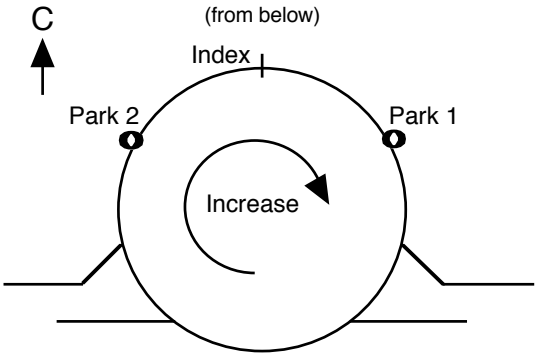
MAIN INJECTOR MI-10H
(from above)



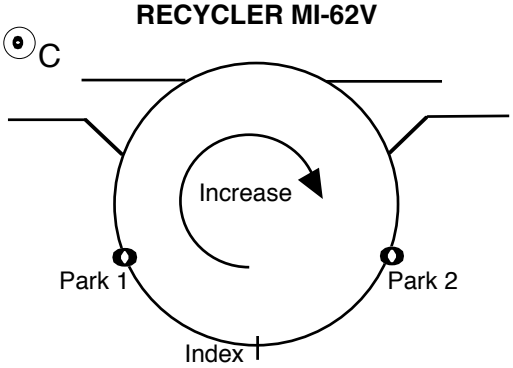
MAIN INJECTOR MI-10V



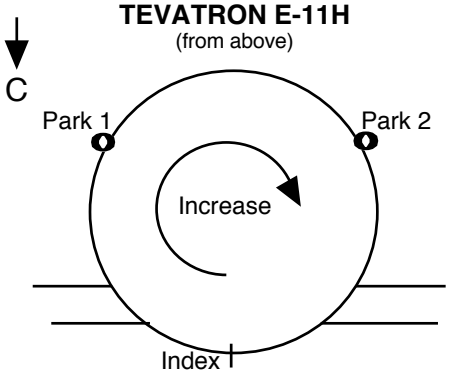
RECYCLER MI-62H
(from below)



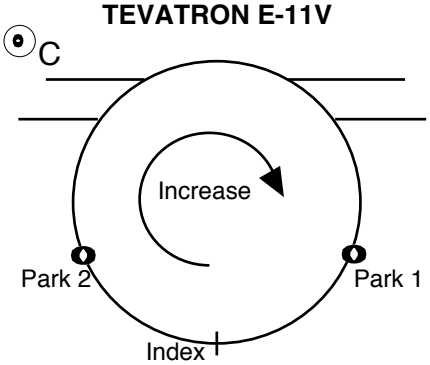
RECYCLER MI-62V



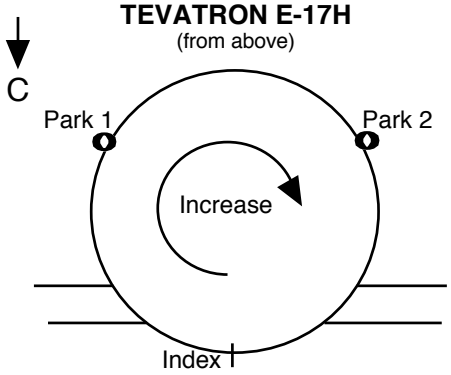
TEVATRON E-11H
(from above)



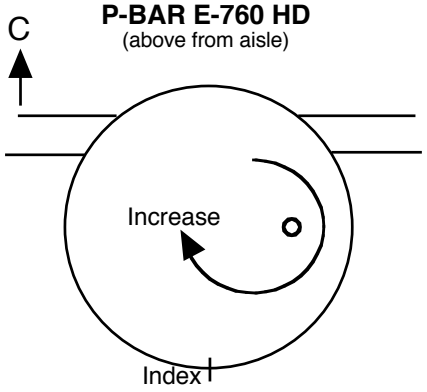
TEVATRON E-11V



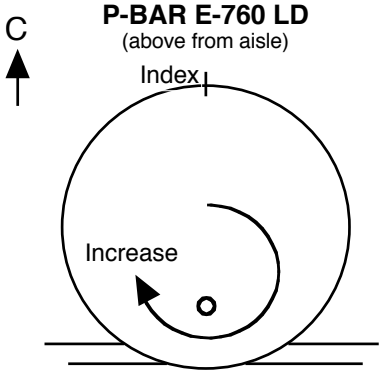
TEVATRON E-17H
(from above)



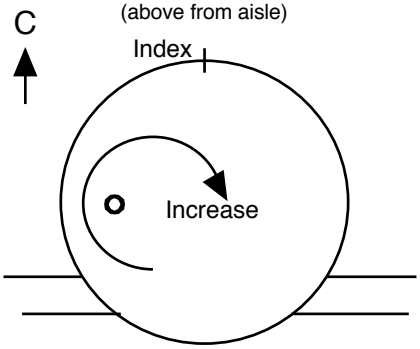
P-BAR E-760 HD
(above from aisle)



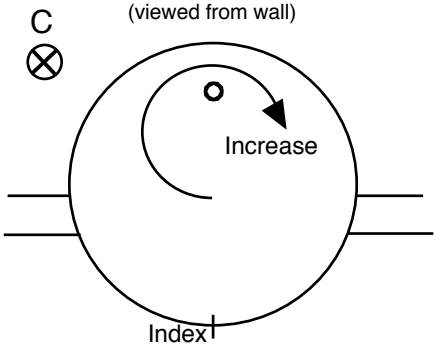
P-BAR E-760 LD
(above from aisle)



P-BAR CORE-H
(above from aisle)

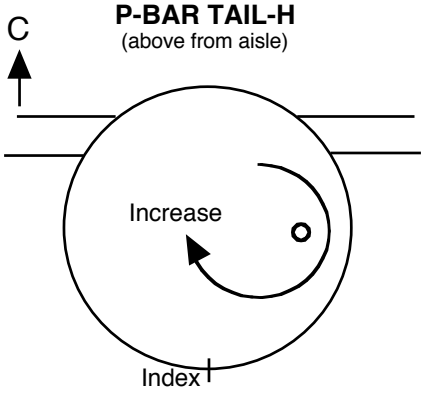
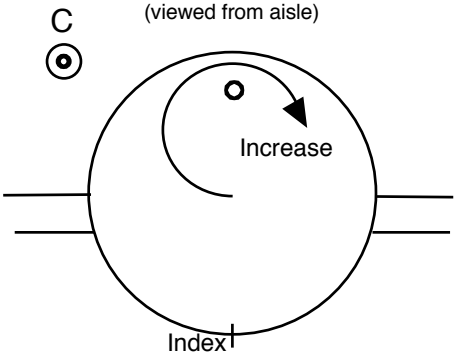


P-BAR CORE-V
(viewed from wall)



Shaft position

P-BAR TAIL-H
(above from aisle)



P-BAR TAIL-V
(viewed from aisle)